Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and other Wireless Devices Aboard Airborne Aircraft	)	WT Docket No. 04-435

COMMENTS OF SPACE DATA CORPORATION

Space Data Corporation ("Space Data") submits these comments in response to the Federal Communications Commission's ("FCC" or "Commission") February 15, 2005 Notice of Proposed Rulemaking ("NPRM") addressing the use of personal wireless devices on aircraft.[1] Space Data supports the Commission's proposal to facilitate the use of handsets and other wireless devices on airborne aircraft because the interests of consumers, homeland security and public safety officials are better served by increased access to communications services during flight. The Commission, however, should ensure that any actions taken in this proceeding do not thwart the development and use of innovative technologies such as balloon-borne stratospheric platforms (and similar technologies) to provide air-to-ground ("ATG") services.

[1] *Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and Other Wireless Devices Aboard Airborne Aircraft*, Notice of Proposed Rulemaking, WT Docket No. 04-425, FCC 04-288 (rel. Feb. 15, 2005) ("NPRM"). The comment date for the NPRM was extended to May 26, 2005. *See* 70 Fed. Reg. 11916 (Mar. 10, 2005), 70 Fed. Reg. 21724 (Apr. 27, 2005).

Specifically, the Commission should ensure that its rules regarding the operation of wireless devices on aircraft are technologically neutral. It should: (1) lift the existing prohibition against using 800 MHz cellular handsets on airplanes and decline to extend the prohibition to personal communications service ("PCS") devices; and (2) not require the use of pico cells to provide ATG services if the specific service can be provided without causing harmful interference to terrestrial wireless licensees. To the extent that the Commission allows the use of pico cells in the provision of ATG services, safety, interference and public interest concerns require that interference testing be carried out at the full transmit power of wireless handsets and that pico cells be required to support multiple communications protocols and spectrum bands.

I. THE COMMISSION SHOULD ADOPT TECHNOLOGICALLY NEUTRAL RULES FOR THE USE OF WIRELESS DEVICES ON AIRPLANES.

The Commission's existing prohibition against the use of 800 MHz cellular handsets on aircraft in flight was adopted in the early 1990s to prevent potentially harmful interference to terrestrial cellular networks.[2] Since that time, multiple wireless services have developed,

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[2] *Amendment of Part 22 of the Commission's Rules in the Matter of Airborne Use of Cellular Telephones and the Use of Cell Enhancers in the Domestic Public Cellular Radio Service*, 7 FCC Rcd 23 (1991). The prohibition is codified at Section 22.295 of the Commission's rules, 47 C.F.R. § 22.295.

In a separate proceeding, the Federal Aviation Administration ("FAA") is addressing whether to maintain its own regulations that oversee the use of wireless personal devices on aircraft to ensure that they do not compromise the aircraft communications and navigation systems. *See NPRM* ¶¶ 3, 9. The FAA has asked RTCA, Inc. ("RTCA"), a federal advisory committee, to study the impact of personal electronic devices on aircraft navigation and safety. In the first phase of its study, the RTCA developed testing procedures to guide the efforts of equipment manufacturers, service providers, and airlines to assess the interference risks associated with the use of personal electronic devices on aircraft. For example, RTCA's report indicates that narrowband PCS devices that use the ReFLEX protocol likely will not interfere with aircraft equipment in flight because the devices typically operate at low power, and the transmissions occur in short bursts. Also, because multiple users share the same frequency in a time division polled mode of operation, only one unit will transmit at a time. *See* RTCA, Inc., *Guidance on*

including personal communications service ("PCS") and specialized mobile radio ("SMR"), which are not covered by the Commission's ban on handset use. The intervening years also have seen tremendous development and innovation in wireless technologies that may make the FCC's handset prohibition against cellular or any other type of wireless equipment outmoded because these technologies minimize potential interference with terrestrial licensees. The flying public will be better served if the Commission relies upon available technological solutions to minimize any potential terrestrial interference concerns rather than needlessly extending a blanket restriction on wireless handset use to other services. As further explained below, a blanket restriction is particularly harmful if applied to wireless networks or devices (such as narrowband PCS) that will not cause harmful interference to terrestrial networks. An over-inclusive prohibition could block non interfering operators from providing competitive ATG services.

One technological development that may facilitate the use of wireless handsets and other devices on airplanes is a pico cell, which would direct handsets to operate on an airplane at or near their lowest applicable power setting.[3] A pico cell would receive the transmissions from wireless devices used on an airplane and serve as a conduit to the ground for those transmissions. Under one pico cell model, passenger handsets may transmit at or near their lowest power level on their existing cellular, PCS, or SMR frequencies so that the transmissions are received only by the pico cell. Spectrum specifically allocated for the

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Allowing Transmitting Portable Electronic Devices (T-PEDs) on Aircraft, DO-294, SC-202 (Oct. 19, 2004). The Commission should limit its inquiry in this proceeding only to whether wireless devices cause harmful interference to terrestrial licensees in order to avoid duplication of the FAA's ongoing parallel study.

[3] NPRM ¶4.

provision of commercial ATG services would then act as a communications "pipe" between the pico cell and the ground.

Personal handsets or other wireless devices can be used on an airplane using technologies other than a pico cell, and the Commission should not dictate a single business model or technology for all ATG services. For example, wireless service possibly could be provided to airline passengers using only the ATG Band (*e.g.*, between the handset, a transmitter, and to the ground), rather than using the ATG band exclusively for the transmission path between a pico cell and the ground. Promoting the development of competitive ATG services is best accomplished by adopting rules that do not discriminate or favor one type of technology or business plan over another. So long as an ATG service provider can ensure that the operation of wireless handsets on airplanes does not interfere with terrestrial operations, it is immaterial whether its network utilizes a pico cell or other equipment to control interference.[4]

For example, Space Data has developed and successfully deployed an innovative network of balloon-borne stratospheric platforms using narrowband PCS technology. As Space Data previously explained in its response to the Commission's rulemaking proceeding regarding the rebanding of the ATG band,[5] these platforms are located in the stratosphere at altitudes two to three times higher than the flight path of commercial aircraft. Thus, they have the ability to cover very large geographic areas with broad antenna beams. The extensive cell

[4] In fact, airlines may prefer a solution that does not depend upon the installation of pico cells or other equipment because of the weight and space requirements of that equipment.

[5] *See, e.g.*, Reply Comments of Space Data Corporation, WT Docket No. 03-103 (Oct. 23, 2003) ("Space Data Reply Comments"); Space Data Corporation: Air-to-Ground Analysis, attached to Letter from Cheryl A. Tritt, counsel to Space Data Corporation, to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 03-103 (Sept. 9, 2004).

size and position of these platforms above aircraft allow these systems to provide ATG services directly to airborne user handsets without transmitting through a pico cell and without causing harmful interference to terrestrial networks in adjacent bands. As explained below, ATG and narrowband PCS are licensed on a nationwide basis, thus transmitting personal electronic devices using these spectrum frequencies cannot create co-channel interference with terrestrial networks anywhere in the country. Furthermore, stratospheric base stations cannot create adjacent channel interference to terrestrial networks because no near-far interference is created. Specifically, a user device cannot be physically near a transmitter located at altitudes over 65,000 feet. Typically in a terrestrial environment the near-far interference is solved by using guard bands of fallow spectrum between adjacent users. Networks utilizing stratospheric base stations, however, eliminate the need for guard bands because no near-far interference is generated.[6]

The configuration of an ATG licensee's network and its technology also may minimize or eliminate the need to use a pico cell or similar equipment. As noted in the NPRM, the Commission's ban on handset use on aircraft in flight is based on its finding that the signal from an airborne handset can travel significantly farther than a signal from a handset operating terrestrially, because the airborne signal is not attenuated by terrain, physical obstacles and the curvature of the earth.[7] Because most cellular, PCS and SMR licenses are assigned on a regional basis (*e.g.*, cellular market areas, metropolitan trading areas, basic trading areas), an airborne handset signal could be strong enough to span multiple geographic licensed areas and

[6] *See* Space Data Reply Comments at 5.

[7] NPRM ¶6.

cause co-channel interference to multiple cell sites.[8] For services licensed on a nationwide basis, such as narrowband PCS and ATG, (or licensees that hold sufficient geographic licenses to effectively create a nationwide footprint), no interference protection is required for co-channel licensees.

As a practical matter, requiring all airborne wireless handsets to transmit through a centralized access point, such as a pico cell, also restricts consumers' choice of service providers to the carrier or third party servicing that access point. This result does not appreciably differ from the legacy ATG rules, which the Commission recently endeavored to change in order to promote competition in the commercial ATG market. The Commission should instead adopt a more flexible approach that would allow handsets to communicate directly with ATG or narrowband PCS networks if the communication does not interfere with terrestrial operations. This also would avoid some of the expense that an ATG service provider would incur with the installation of special equipment in each airplane.

II. ANY TESTING AND USE OF PICO CELLS MUST TAKE SAFETY AND INTERFERENCE CONCERNS INTO CONSIDERATION.

To the extent that the Commission allows carriers to use pico cells to provide ATG services, it must ensure that any testing and use of those pico cells address potential safety and interference issues. Specifically, all interference testing (and any rules adopted as a consequence of that testing) must be carried out at the full transmit power of the wireless handsets. Although a pico cell is intended to limit wireless airborne handsets to operations at or near their lowest applicable power settings, it is conceivable that at some point, with thousands of pico cells potentially in the sky at any time, a few pico cells will malfunction and will not prevent handsets from transmitting at their highest power levels as they seek out

[8] *Id.*

terrestrial networks. For example, the software in a pico cell that controls handset transmissions may fail, or a portion of the pico cell could become damaged. A more likely occurrence is handsets operating at full power due to a malfunction within the handset, which would be extremely difficult, if not impossible, to police. Thus, a worse case scenario must be used to determine whether and how harmful interference may be created with terrestrial wireless systems.

Furthermore, in addition to carrying out interference testing at the highest handset power levels, pico cells should be required to support all widely-used protocols (*e.g.*, AMPS, CDMA, GSM, TDMA, iDEN) and spectrum bands (*e.g.*, cellular, PCS, SMR). The typical consumer does not know his or her wireless handset's protocol(s) or the frequencies at which it operates. An airline's flight crew and personnel, whose primary responsibility is to ensure the safety and comfort of passengers, cannot be held responsible for accurately informing passengers which types of wireless devices can be used while in flight, and it is unrealistic to assume that airlines would impose that burden on their personnel. Consequently, passengers that have handsets that are not controlled by an on-board pico cell will assume they can use their handsets while airborne and the handsets will operate at their highest power while trying to directly link with a terrestrial tower.

Therefore, wireless carriers and vendors must cooperate to establish industry requirements and guidelines if airline passengers, airline employees, and emergency and security personnel are to have the freedom to use their personal wireless handsets in flight. Moreover, if a pico cell operator supports only one protocol or set of frequencies to the exclusion of all others, competitive ATG services within the airplane would be available only if two or more separate pico cell systems were installed on an airplane. The operating costs and

extra weight of a second system make it extremely unlikely that airlines wound allow more than one pico cell system on an airplane.

III. CONCLUSION.

Space Data urges the Commission to ensure that innovative technologies such as balloon-borne stratospheric platforms (and similar technologies) to provide ATG services are not precluded by extending its existing prohibition against the use of 800 MHz cellular handsets on airplanes to PCS devices and by requiring carriers to use pico cells to provide ATG services. Furthermore, the Commission should require all testing of pico cells to be carried out at the full transmit power of wireless handsets and that pico cells support all protocols and spectrum bands.

Respectfully submitted,

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